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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,216	09/01/2005	Ping Wang	089-498-0436	7310
39905 7590 06/03/2008 ROETZEL AND ANDRESS 222 SOUTH MAIN STREET AKRON, OH 44308				
EXAMINER				
KAM, CHIH MIN				
ART UNIT		PAPER NUMBER		
1656				
MAIL DATE		DELIVERY MODE		
06/03/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/519,216

**Applicant(s)**

WANG ET AL.

**Examiner**

CHIH-MIN KAM

**Art Unit**

1656

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5-9, 11, 13 and 15 is/are rejected.
- 7) ☒ Claim(s) 4, 10, 12, 14 and 16-19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/888)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of the Claims***

1. Claims 1 and 3-19 are pending.

Applicants' amendment filed March 3, 2008 is acknowledged. Claims 1, 5 and 11-14 have been amended, claim 2 has been cancelled, and new claims 18 and 19 have been added. Therefore, claims 1 and 3-19 are examined.

### **Withdrawn Informalities**

2. The previous objection to the specification regarding the cross-references is withdrawn in view of applicants' amendment to the specification, and applicants' response at page 6 in the amendment filed March 03, 2008.

### **Withdrawn Claim Rejections - 35 USC § 102**

3. The previous rejection of claims 1, 4, 6-13 and 15 under 35 U.S.C. 102(b) as being anticipated by Cremonesi (US 4,338,401), is withdrawn in view of applicants' amendment to the claim, and applicants' response at pages 6-7 in the amendment filed March 03, 2008.
4. The previous rejection of claims 1, 3-11, 13, 16 and 17 under 35 U.S.C. 102(b) as being anticipated by Matsumoto *et al.* (US 4,371,612), is withdrawn in view of applicants' amendment to the claim, and applicants' response at pages 7-8 in the amendment filed March 03, 2008.
5. The previous rejection of claim 2 under 35 U.S.C. 102(b) as being anticipated by Tennent *et al.* (US 6,099,960), is withdrawn in view of applicants' cancellation of the claims in the amendment filed March 03, 2008.
6. The previous rejection of claims 1-3, 5, 8, 9, 11, 13 and 14 under 35 U.S.C. 102(b) as being anticipated by Greiner *et al.* (US 6,667,099), is withdrawn in view of applicants'

amendment to the claim, applicants' cancellation of the claims, and applicants' response at pages 9-10 in the amendment filed March 03, 2008.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3, 5, 8, 9, 11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tennent et al (US 6,099,960, issued 8 Aug 2000).

Tennent et al teach a nanofiber comprising carbon. This nanofiber is functionalized so that it may immobilize active groups. In particular the active groups can be enzymes, antibodies, or antigens (see col. 10, lines 16-41, for example). Therefore the teachings of Tennent *et al.* are deemed to anticipate instant claims 1, 3, 5, 8, 9, 11, and 13.

**Response to Arguments**

Applicants indicate Tennent *et al.* fails to disclose each and every feature of claims 1-3, 5, 8, 9, 11 and 13. Specifically, Tennent *et al.* fails to disclose a fibrous protein-immobilization system composition comprised of a nanofiber made from fiber-forming material and a protein attached to the fiber-forming material. Thus, Tennent *et al.* cannot anticipate claims 1-3, 5, 8, 9, 11 and 13. Thus the rejection should be withdrawn (pages 809 of the response).

Applicants' response has been considered, however, the arguments are not found persuasive because Tennent *et al.* does teach a nanofiber comprising carbon and the nanofiber is

functionalized to immobilized active groups such as enzymes, antibodies or antigens, which meets the criteria of the claimed invention. Therefore, the rejection is maintained.

8. Claims 1, 6-9, 11, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Iyer *et al.* (Abstracts of Papers, 221<sup>st</sup> ACS national meeting, San Diego, CA, United States, April 1-5, 2001, ANYL-035).

Iyer *et al.* teach the use of cellulose nanofiber (30-60 nm diameter) and carbon nanotubes as immobilized matrixes, enzymes can be site-specifically immobilized onto these supports by protein spacer methods or binding domains (Abstract). For example, subtilisin was site-specifically immobilized onto cellulose nanofibers by a protein spacer method leading to high catalytic efficiency, cellulose nanofibers functionalized with polyamino acid were used for high capacity heavy metal ion capture (claims 1, 6-9, 11, 13 and 15).

#### ***Claim Objections***

9. Claims 4, 10, 12, 14 and 16-19 are objected to for depending from a rejected claim.

#### ***Conclusions***

10. Claims 1, 3, 5-9, 11, 13 and 15 are rejected; and claims 4, 10, 12, 14 and 16-19 are objected to.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathleen Bragdon can be reached at 571-272-0931. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chih-Min Kam/

Primary Examiner, Art Unit 1656

CMK

May 30, 2008

